

## INTERNATIONAL SEARCH REPORT

International Application No

PCT/JP2004/012672

## A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 G06F17/60 G06F17/50 G05B19/18 H05K13/04

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 G06F G05B H05K

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, INSPEC, PAJ, COMPENDEX, IBM-TDB

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 1 227 711 A (MATSUSHITA ELECTRIC INDUSTRIAL CO., LTD) 31 July 2002 (2002-07-31) abstract paragraph '0084!; figures 7,8	1-14,16
A	WONSIK LEE ET AL: "A genetic optimization approach to operation of a multi-head surface mounting machine" IEICE TRANSACTIONS ON FUNDAMENTALS OF ELECTRONICS, COMMUNICATIONS AND COMPUTER SCIENCES INST. ELECTRON. INF. & COMMUN. ENG JAPAN, vol. E83-A, no. 9, September 2000 (2000-09), pages 1748-1756, XP002340697 ISSN: 0916-8508 the whole document	1-14,16



Further documents are listed in the continuation of box C.



Patent family members are listed in annex.

## \* Special categories of cited documents:

- "A" document defining the general state of the art which is not considered to be of particular relevance
- "E" earlier document but published on or after the international filing date
- "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- "O" document referring to an oral disclosure, use, exhibition or other means
- "P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search

21 October 2005

Date of mailing of the international search report

02.11.05

Name and mailing address of the ISA

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International Application No  
PCT/JP2004/012672

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 02/13590 A (MATSUSHITA ELECTRIC INDUSTRIAL CO., LTD; MAENISHI, YASUHIRO; YOSHIDA,) 14 February 2002 (2002-02-14) cited in the application the whole document	1-14,16
A	----- PATENT ABSTRACTS OF JAPAN vol. 1998, no. 13, 30 November 1998 (1998-11-30) & JP 10 209697 A (MATSUSHITA ELECTRIC IND CO LTD), 7 August 1998 (1998-08-07) cited in the application abstract	1-14,16
A	----- PATENT ABSTRACTS OF JAPAN vol. 1997, no. 05, 30 May 1997 (1997-05-30) & JP 09 018199 A (MATSUSHITA ELECTRIC IND CO LTD), 17 January 1997 (1997-01-17) cited in the application abstract	1-14,16
A	----- AYOB M ET AL: "Optimisation for surface mount placement machines" INDUSTRIAL TECHNOLOGY, 2002. IEEE ICIT '02. 2002 IEEE INTERNATIONAL CONFERENCE ON DEC. 11-14, 2002, PISCATAWAY, NJ, USA,IEEE, vol. 1, 11 December 2002 (2002-12-11), pages 498-503, XP010637357 ISBN: 0-7803-7657-9 the whole document	3-10
A	----- PATENT ABSTRACTS OF JAPAN vol. 017, no. 449 (M-1465), 18 August 1993 (1993-08-18) & JP 05 104364 A (SANYO ELECTRIC CO LTD), 27 April 1993 (1993-04-27) abstract	11,12

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international application No.  
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## Box II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:  
because they relate to subject matter not required to be searched by this Authority, namely:
  
2. ☒ Claims Nos.: 15  
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:  
see FURTHER INFORMATION sheet PCT/ISA/210
  
3. ☐ Claims Nos.:  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

## Box III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☒ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☒ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-2,13,14,16

Optimizing an order of component mounting for a plurality of  
mounters via identical sub-board patterns; optimizing the  
order of component mounting for any one pattern  
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2. claims: 3-10

Adding a number determination step for the number of  
patterns to be allocated to each mounter  
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3. claims: 11-12

Optimization by making distances uniform  
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## FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

Continuation of Box II.2

Claims Nos.: 15

Claim 15 claims a mounter, but the features of claim 15 are regarding the mounting order the mounter receives, i.e. the mounter of claim 15 cannot be decided from a conventional mounter.

The applicant's attention is drawn to the fact that claims relating to inventions in respect of which no international search report has been established need not be the subject of an international preliminary examination (Rule 66.1(e) PCT). The applicant is advised that the EPO policy when acting as an International Preliminary Examining Authority is normally not to carry out a preliminary examination on matter which has not been searched. This is the case irrespective of whether or not the claims are amended following receipt of the search report or during any Chapter II procedure. If the application proceeds into the regional phase before the EPO, the applicant is reminded that a search may be carried out during examination before the EPO (see EPO Guideline C-VI, 8.5), should the problems which led to the Article 17(2) declaration be overcome.

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

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Patent document cited in search report		Publication date	Patent family member(s)	Publication date
EP 1227711	A	31-07-2002	WO 0124598 A1 US 6842974 B1	05-04-2001 18-01-2005
WO 0213590	A	14-02-2002	CN 1466864 A EP 1350419 A2 US 2004073322 A1	07-01-2004 08-10-2003 15-04-2004
JP 10209697	A	07-08-1998	JP 3653911 B2	02-06-2005
JP 09018199	A	17-01-1997	NONE	
JP 05104364	A	27-04-1993	JP 2957778 B2	06-10-1999